

# Performance of young Nellore bulls grazing marandu grass pasture at different heights

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## Introduction

Brazil is one of the largest beef cattle producers in the world with approximately 200 M head. The Industry relies predominantly on warm-season grass pastures, with approximately 90% of animals finished on pastures.

One of the main factors for the intensification of animal production systems based on pasture is appropriate management. Adjustment of stocking rate to maintain optimum forage allowance is essential. Studies on forage allowance have resulted in a better understanding of the response of forage crops and animals to changes in grazing intensity.

The purpose of this study was to evaluate management strategies for beef cattle systems grazed at different heights (15, 25 and 35 cm) in *Brachiaria brizantha* cv. Marandu in terms of pasture production and animal performance.

## Material and Methods

The experiment was conducted at Animal Science Department, Sao Paulo State University, Jaboticabal, São Paulo, Brazil (21°15'22"S; 48°18'58"W; 595 m asl). The trial was set up in an area of *Brachiaria brizantha* cv. Marandu pastures established in 2001 on a red latosol.

Fertiliser was applied at the rate of 90 kg N/ha in the rainy season. According to the Köppen classification, the

climate of Jaboticabal is characterised as Awa, or subtropical with dry winters and rainy summers. The experimental period was from January to April 2012 during the rainy season. Experimental paddocks (6.0 ha) were managed under continuous stocking, with variable stocking rates to give 3 grazing heights (15, 25 and 35 cm) using young Nellore bulls.

Forage quantitative and structural components were measured monthly using samples collected from the sites at medium height and separated into leaf blades, stems and leaf sheaths, and dead matter. All forage included within the perimeter of the rising plate (0.25 m<sup>2</sup>) was collected at the soil level. Individual animal performance was measured by weighing animals at the start and end of the experiment, after a 12-hour period of complete fasting.

Data were analysed by a complete randomised design with 3 grazing heights (15, 25 and 35 cm) and 2 replications (paddocks) with 6 animals per paddock, and period in repeated measures over time. Data were analysed using the GLM procedure of SAS.

## Results and Discussion

Total herbage mass and leaf and stem proportions decreased, and dead material increased along the experimental period (Table 1). Herbage mass increased in response to grazing height, while structural characteristics

**Table 1. Total herbage mass and mass of the components in *Brachiaria brizantha* cv. Marandu pastures managed at 3 forage heights under a continuous stocking system during the rainy season. Means followed by the same lower-case letters in rows and upper-case letters in columns for each analysed factor were not significantly different according to Tukey's test at 10% probability. Experimental periods: 1st: 01/27/2012; 2nd: 02/25/2012; 3rd: 03/23/2012; 4th: 04/21/2012.**

Variable	Height (cm)	1st period	2nd period	3rd period	4th period
Forage mass (kg/ha)	15	6542 Ca	4934 Cb	3524 Cc	2114 Cd
	25	8297 Ba	8646 Ba	7208 Bb	5770 Bc
	35	13512 Aa	11614 Ab	10058 Ac	8502 Ad
Leaf mass (%)	15	38.7 Ba	33.9 Ab	24.9 Ac	16.0 Ad
	25	44.5 Aa	31.1 Ab	25.0 Ac	18.9 Ad
	35	37.4 Ba	34.3 Ab	26.0 Ac	17.7 Ad
Stem mass (%)	15	28.5 Ab	31.9 Aa	27.6 Bb	23.2 Cc
	25	28.2 Ab	33.3 Aa	30.6 Ab	27.9 Bc
	35	26.3 Ab	32.3 Aa	31.4 Aa	30.6 Aa
Dead mass (%)	15	32.7 Bd	34.1 Ab	47.4 Bc	60.7 Aa
	25	27.2 Cd	35.5 Ab	44.3 Ac	53.0 Ba
	35	36.2 Ac	33.3 Ad	42.4 Ab	51.6 Ba

**Table 2. Initial and final weights and performance of young Nellore bulls grazing *Brachiaria brizantha* cv. Marandu pastures at 3 different heights during the rainy season. Means followed by the same lower-case letter within columns for each analysed factor were not significantly different according to Tukey's test at 10% probability.**

Height (cm)	Variable			
	IW (kg)	FW (kg)	ADG (kg/d)	AG (kg/ha/d)
15	243.0 a	279.2 c	0.3 b	2.5 c
25	242.6 a	314.9 b	0.6 a	3.6 a
35	245.9 a	330.0 a	0.7 a	3.2 b

did not respond uniformly to grazing height.

With the decline in both rainfall and temperatures in March-April in Brazil, tropical grasses begin to senesce, resulting in a higher proportion of stem and dead material, with the effect most obvious in swards managed at greater heights. In general, crude protein and digestibility values decreased, while cell wall increased over the experimental period.

Animal ADG increased in response to pasture height (Table 2), mainly related to higher herbage allowance in this pasture. According to Poppi and MacLennan (2007),

average daily weight gain from tropical pastures during the wet season ranges from 0.5 to 0.7 kg/d depending on herbage allowance. Our observations at the greater herbage heights conform with this suggestion.

## Conclusion

While increasing herbage grazing height increased animal weight gains, there was a plateauing effect between 25 and 35 cm. The increased grazing pressure to maintain pastures at the lower height more than compensated for the slightly higher daily gains at the higher grazing height. Grazing intensity should be manipulated to obtain a compromise between gains per individual and gains per hectare.

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## References

- Poppi DP, MacLennan SR (2007) Optimizing performance of grazing beef cattle with energy and protein supplementation. In 'Anais do 6 Simpósio sobre bovinocultura de corte, FEALQ, Piracicaba 2007', pp. 163-182. (FEALQ: Piracicaba, Brazil)